	Application No.	Applicant(s)
Notice of Allowability	10/051,469	GONG, YIFAN
	Examiner	Art Unit
	Martin Lerner	2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Preliminary Amendment filed 18 January 2002*.

2. ☒ The allowed claim(s) is/are *1 to 7*.

3. ☒ The drawings filed on *18 January 2002* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

       1. ☐ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

       3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

       1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

Independent claim 1 is allowable because the prior art of record does not disclose or suggest determining the mismatch of a voice signal between a reference path and a test path by modeling convolutive noise and additive noise using a maximum likelihood criterion, where additive noise is modeled by polynomial functions of order P and convolutive noise is modeled by polynomial functions of a different order Q. Generally, it is known in the prior art to model speech as convolutive noise H_Δ and additive noise N_N and using a maximum likelihood criterion to estimate model parameters. See e.g., *Cerisara et al., Feder et al., and Raj et al.* However, the prior art does not disclose or suggest solving polynomial functions with one order for H_Δ and a different order for N_N. Applicant's Specification, Pages 14 to 15, discloses a polynomial model provides a better noise estimate and lower error than an independent-component bias model.

Independent claims 4 and 6 are allowable because the prior art of record does not disclose or suggest detecting an output power density of a reference path Y_R and an output power density of a test path to produce a power density of a mismatch signal Y_N, where a noise estimate Θ_N is calculated as:

$$(D - B^t A^{-1} B)\, \Theta_N = v - B^t A^{-1} u,$$

and a channel estimate Θ_H is calculated as:

$$\Theta_H = A^{-1}(u - B\, \Theta_N).$$

Generally, it is known in the prior art to model speech as convolutive noise H_Δ and additive noise N_N and using a maximum likelihood criterion to estimate model parameters. See e.g., *Cerisara et al., Feder et al., and Raj et al.* However, the prior art does not disclose or suggest calculating quantities with these Equations. Applicant's Specification, Pages 14 to 15, discloses a polynomial model provides a better noise estimate and lower error than an independent-component bias model.

Independent claims 5 and 7 are allowable because the prior art of record does not disclose or suggest detecting an output power density of a reference path Y_R and an output power density of the a path to produce a power density of a mismatch signal Y_N, where a noise estimate Θ_N and a channel estimate Θ_H are calculated by the given matrix Equation. Generally, it is known in the prior art to model speech as convolutive noise H_Δ and additive noise N_N and using a maximum likelihood criterion to estimate model parameters. See e.g., *Cerisara et al., Feder et al., and Raj et al.* However, the prior art does not disclose or suggest calculating quantities with these Equations. Applicant's Specification, Pages 14 to 15, discloses a polynomial model provides a better noise estimate and lower error than an independent-component bias model.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-
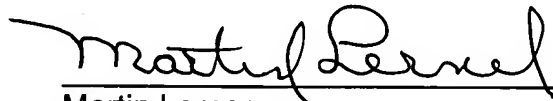
9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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3/1/05

Martin Lerner
Examiner
Group Art Unit 2654